

WHAT IS CLAIMED IS:

- 1 ~~1. An image processing method for generating a gray level rendered~~
2 pixel value comprising the steps of :
3 providing a digitized image that has a plurality of pixels with each
4 of the pixels being rendered into a halftoned microdot having a density, the
5 microdot existing within one of a plurality of halftoning planes, wherein
6 the halftoning planes are indicative of an intensity value for the pixels;
7 forming a plurality of tiles from the microdots in accordance with a
8 screen angle and a line ruling from a halftone screen used to converted the
9 pixels into the microdots, wherein each of the tiles comprises a repetitive
10 sequence of microdots;
11 associating each of the microdots within the tiles by a coordinate
12 position as well as the density value;
13 storing the tiles into a buffer having a length and a width; and
14 placing into the buffer an offset determined by the tile geometry,
15 wherein the offset acts as a pointer to read data out offset by a
16 predetermined amount in order to generate the repetitive sequence of
17 microdots; and
18 reading the buffer to retrieve stored image data comprising density
19 value.
- 1 2. The image processing method of claim 1 wherein the density value
2 for a pixel is a stored value that characterizes the value of the microdots in the
3 halftone plane.
- 1 3. The image processing method of claim 2 wherein an average
2 density value for the tile characterizes the tile to the halftoning plane.
- 1 4. The image processing method of claim 2 wherein the density value
2 is a stored value within the buffer, the density value being an output from the
3 halftone plane.
- 1 5. The image processing method of claim 4 wherein the halftone
2 plane is an input halftone plane that functions as an address to the buffer, the
3 buffer data addressed being the density value that is an output halftone plane that
4 is represented by a different number of bits than the input halftone plane.

1 ~~6. The image processing method of claim 4 wherein the halftone~~
2 plane is an input halftone plane that functions as an address to the buffer, the
3 buffer data addressed being the density value that is an output halftone plane that
4 is represented by the same number of bits as the input halftone plane.

1 7. The image processing method of claim 2 wherein the buffer is a
2 lookup table that stores halftone rendering values in accordance with a mixed dot
3 growth pattern.

1 8. The image processing method of claim 7 wherein the buffer further
2 comprises a second lookup table and in the lookup table there is stored halftone
3 rendering values in accordance with a partial dot growth pattern.

1 9. The image processing method of claim 1 wherein the coordinate
2 value I is determined according to a calculation wherein $I = (X + Y * Bs) \% Bw$,
3 wherein X,Y represent an image pixel address, Bs represents the offset value used
4 for establishing a start location for alternate repeats of the sequences of pixels, Bw
5 represents a sequence width, and % identifies a calculation process wherein a
6 division operation is provided and the remainder of the division operation is
7 retained as the coordinate value.

1 10. The image processing method of claim 1 wherein the coordinate
2 value I is determined according to a calculation wherein $I = (X + Y * Bs) \% Bw$,
3 wherein X,Y represent an image pixel address, Bs represents a brick offset value
4 used for establishing a start location for alternate repeats of a series or brick of
5 rendering values for a predetermined gray level, Bw represents a brick width, and
6 % identifies a calculation process wherein a division operation is provided and the
7 remainder of the division operation is retained as the coordinate value.

1 11. The image processing method of claim 1 wherein the coordinate
2 value I is determined according to a calculation wherein $I = (X +$
3 $(Y / Bh) * Bs) \% Bw$, wherein X,Y represent an image pixel address, Bs represents a
4 brick offset value used for establishing a start location for alternate repeats of a
5 series or brick of rendering values for a predetermined gray level, Bw represents a
6 brick width, Bh represents a brick height representing different subsets of a series
7 of rendering numbers for a predetermined gray level, and % identifies a

8 ~~calculation process wherein a division operation is provided and the remainder of~~
9 ~~the division operation is retained as the coordinate value.~~

1 12. The image processing method of claim 9 wherein a coordinate
2 value J is determined according to a calculation wherein $J=Y\%B_h$.

1 13. The image processing method of claim 1 further comprising the
2 step of blending rendered values from the halftoning processes via at least one
3 additional halftoning processes.

1 14. The image processing method of claim 13 further comprising the
2 step of edge enhancement processing.

1 15. An image processing system for generating gray level pixel values
2 comprising:

3 a lookup table storing gray level pixel values representing rendered
4 values of a halftoning process into one of a plurality of halftoning planes;
5 and

6 an input to the lookup table providing a coordinate value of a
7 current pixel to be rendered and a gray level of the pixel to be rendered.

1 16. The image processing system of claim 15 wherein the coordinate
2 value I is determined according to a calculation wherein $I = (X + Y * B_s) \% B_w$,
3 wherein X, Y represent an image pixel address, B_s represents a brick offset value
4 used for establishing a start location for alternate repeats of a series or brick of
5 rendering values for a predetermined gray level, B_w represents a brick width, and
6 % identifies a calculation process wherein a division operation is provided and the
7 remainder of the division operation is retained.

1 17. The image processing system of claim 15 wherein the lookup table
2 stores gray level values rendered from a digitized image that has a plurality of
3 pixels with each of the pixels being converted into a halftoned microdot that exists
4 within one of the plurality of halftoning planes; wherein the microdots within the
5 halftoning planes are indicative an density value of the pixels rendered.

1 18. The image processing system of claim 17 wherein the lookup table
2 stores a plurality of tiles from the microdots in accordance with a screen angle and
3 a line ruling from a halftone screen used to converted the pixels into the
4 microdots, wherein each of the tiles comprises a repetitive sequence of microdots;

1 20. The image processing system of claim 19 wherein the tiles stored
2 within the lookup table buffer have a length and a width.

21. The image processing system of claim 20 wherein the lookup table also store an offset determined by the tile geometry stored therein, wherein the offset acts as a pointer to read data out offset by a predetermined amount in order to generate the repetitive sequence of microdots.

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